

Appln No. 09/693,226
Arndt. Dated September 23, 2004
Response to Office action of July 06, 2004

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REMARKS/ARGUMENTS

The Applicant thanks the Examiner for the detailed Office Action of 6 June 2004. The objections and submissions made by the Examiner in the Office Action have carefully been considered. It is submitted that distinguishing features are present in the invention and have been brought out in the amended claims.

Specification

In this section of Office Action the Examiner objects to the incomplete referencing of some of the US patents cited in the specification. In response, appropriate corrections have been introduced in the specification.

The Examiner has also objected to the language and the format of the abstract of the disclosure. In reply, the Abstract of the disclosure has been brought into conformity with the US practice.

Claims – Obviousness

In Items 1 to 4, the Examiner objects to claims 1 to 4 of the present application on the basis of the claims being unpatentable over USPN 6,441,921 (Soscia) in view of USPN 5,771,245 (Zhang).

In response, the Applicant files the following submission.

Soscia discloses a system that is very different from the present invention as claimed. The system discussed in Soscia relates to concealing printed coded data within a printed image (please see Figures 3 and 4, as well as all the claims). In particular, the Applicant draws the Examiner's attention to lines 34-37 in column 5, which state that the infrared inks are not entirely invisible. The text then describes that Soscia deals with this problem by integrating the infrared data into relatively dark regions of the printed image. The structure and the size of the data is not mentioned, but the fact that the preferred embodiment refers to a sound clip for a greeting card suggests that a relatively small amount of coded data is encoded in the image. Another clear limitation on the amount of encoded data is implied by the relatively small image area that is considered suitable for concealing the coded data (see Figs 3 and 4 in Soscia).

In contrast, the present invention is directed towards encoding and reading a large amount of data from a surface that may or may not have any other images, as highlighted in the amended claim 1. As page 4, line 29 to page 5, line 5 of the present application disclose, an embodiment of the invention can include 3-4 MB of data, which is the equivalent of more than 1500 pages of text. This is only possible if the coded data is printed over a substantial portion of the entire surface of the card, and at a relatively high resolution, such as 1600 dpi as disclosed by the Applicant. This printing resolution, on the other hand, requires the reading of the coded data to be performed by a sensor with even higher resolution, such as the 4800 dpi sensor disclosed by the Applicant. These features are disclosed in the associated application ART02US (see section "Reading Data from the Artcard – General Considerations", as well as figures 47 and 48), which is cross-referenced on line 20, page 1 of the subject application. They have now been included in additional claims 5 to 7 of the application.

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Further to the above statement, it is submitted that there is nothing to direct a skilled addressee faced with the problem of the present invention of printing a large amount of **image data** to refer to Soscia, which discloses the encoding and reading of a relatively small amount of **sound data** under specific conditions.

In addition, the high resolution and small size of the data points makes the fault tolerance formatting vital for the present invention. This may not be necessary the case with Soscia, depending on the size and the print resolution of the coded data used there. This lack of clear association renders a combination between Soscia with Zhang not obvious.

Another good reason against combining Zhang with Soscia relates to the fact that Zhang's disclosure is directed to "glyphs" – a data format that is employed neither by Soscia (see Fig. 4b), nor the Applicant (see Fig. 57 of the co-pending application ART02US).

Correspondingly, it is submitted that an ordinary worker in this field, apprised of the Soscia's document, would not have derived the specific combination of features defined by claim 1 as a matter of straightforward routine. Thus, claim 1 clearly possesses the requisite inventive step to qualify for patentability. Consequently, claims 2 to 4, as well as the newly added claims 5 to 7, are also non-obvious, by virtue of their dependence on the amended claim 1.

The applicant further contests the Examiner's conclusion that the features of claim 3 and 4 are taught by Soscia. Claim 3, for example, refers to an output device including a display. The Applicant believes that the expression "output" makes it explicitly clear that the device is associated with the output from the reading device that displays the decoded image, as explained in lines 15-20 on page 5 and figure 1 of the present application. In contrast, the display monitor 25 in Figure 1 of Soscia is associated with the printer and is used to display various formatting options related to the encoding of the data(see last paragraph in column 4 of Soscia). This display, however, is not associated in any way with the output from reading the encoded data. This is not unexpected, in view of the fact that the output is a sound data that is outputted by a speaker.

In relation to claim 4, as was mentioned above, whilst Soscia mentions infrared inks, he also states that "While such inks are largely neutral with respect to visible light, they are not entirely so..." Then he goes on to outline his arrangement of solving this problem by concealing the coded data within other printed visual images. Thus, the disclosure of Soscia clearly refers to infrared inks with some appreciable degree of visible absorption and not the infrared inks in claim 4 of the present invention which are defined to have "negligible absorption in the visible spectrum".

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In light of the above discussion, it is respectfully submitted that all of the Examiner's objections have been successfully traversed. Accordingly, the Applicant believes that the application is now in condition for allowance. Reconsideration and allowance of the application is courteously solicited.

Very respectfully,

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TITLE OF THE INVENTION

PRINTED CARD BASED USER INTERFACE SYSTEM

FIELD OF THE INVENTION

5 The present invention relates to an user interface system for recovering digital data printed in infra-red ink in a fault tolerant encoded form on a print media using an inkjet printing system. In particular, the data may be encoded on the same surface as a human readable representation, for example an image which is related to the data which is encoded thereon.

10 CO-PENDING APPLICATIONS

Various methods, systems and apparatus relating to the present invention are disclosed in the following co-pending applications filed by the applicant or assignee of the present invention simultaneously with the present application:

US Patent Application/Granted Serial Number (which would be filed in at a later date, when the number is received)	Docket No.
09/ 6496,654	ART80US
09/693,083	ART81US
09/693,134	ART82US
09/ 6647,369	ART83US
09/693,317	ART-85US

15 The disclosures of these co-pending applications are incorporated herein by reference.

Various methods, systems and apparatus relating to the present invention are disclosed in the following co-pending granted applications filed by the applicant or assignee of the present invention on July 10, 1998:

USSN 09/113,070 (Docket No. ART02US)6,476,863

20 USSN 09/112,785 (Docket No. ART29US)6,459,495

The disclosures of theseis co-pending granted applications are incorporated herein by reference.

Various methods, systems and apparatus relating to the present invention are disclosed

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in the following co-pending applications/granted patents filed by the applicant or assignee of the present invention on June 30, 2000:

USSN 09/608,308 (Docket No. CPE01US) 6,471,331;

USSN 09/608,779 (Docket No. CPE02US) 6,676,250

5 USSN 09/607,987 (Docket No. CPE03US) 6,347,864

USSN 09/608,776 (Docket No. CPE04US) 6,439,704

USSN 09/_____ (Docket No. CPE05US) 6,425,700

USSN 09/607,991 (Docket No. CPE06US) 6,588,952

The disclosures of these co-pending granted patents/applications is incorporated herein by reference.

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BACKGROUND OF THE INVENTION

The applicant has disclosed in pending granted patents/applications USSN 6,476,863/09/113,070 (Docket No. ART02US) and USSN 6,459,495/09/112,785 (Docket No. ART29US) cards called Artcards in which the information is encoded in black ink on a white background on the reverse face of the printed card, the front surface of the card bearing an image. The data that may be recorded may be the contents of a book recorded in a digital manner with the front face bearing an image equivalent to the dust jacket of the book.

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In such prior art, two printheads are required in order to simultaneously print the image on the front of the card and the digital data on the rear of the card. To read the card, the card is passed through an optical scanning means and the fault tolerant encoded data is reconstructed and decoded and provided to a user as an audio or visual output.

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SUMMARY OF THE INVENTION

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The present invention provides a user interface for reading data encoded in a fault tolerant form in infra-red ink on a surface simultaneously bearing an image.

It is an object of the present invention to provide an apparatus for reading data encoded in a fault tolerant digital form printed in invisible ink on a surface of a card said surface bearing an image comprising:

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- a) scanning means for scanning said encoded fault tolerant digital form of said data on said surface in the infra-red;
- b) means for processing said scanned data and for decoding said data into a secondary digital format;

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- c) means for outputting said data in said secondary digital format to an output device with which said secondary digital format is usable;
- d) said output device presenting said data in a human readable form.

5 Preferably the invisible ink may be an infra-red (IR) absorbing ink with negligible absorption in the visible spectrum.

Preferably, the data is encoded on the card using a Reed-Solomon encoding process after compression of the data. This allows recovery of the data notwithstanding up to 30% damage to the print media upon which the data is recorded (image encoded form). The card for example may be a standard card as disclosed in co-pending applications/granted patents lodged hereto USSN 09/____ (Docket No. ART80US)6,496,654, USSN 09/693,083____ (Docket No. ART81US) and USSN 10 09/693,134____ (Docket No. ART82US) of the size of a photograph of approximately 4" x 6" (102mm x 152mm). It is also contemplated that other formats are also possible for the card for example of the same width but shorter or longer depending upon the amount of data which is recorded or to be recorded on the print media.

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BRIEF DESCRIPTION OF THE DRAWINGS

Notwithstanding any other form which may fall within the scale of the present invention, preferred forms of the invention will now be described by way of example only with reference to the accompanying drawing of Fig 1 which illustrates the card reading arrangement of the preferred embodiment.

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DESCRIPTION OF THE PREFERRED AND OTHER EMBODIMENTS

The preferred embodiment is preferably implemented through suitable programming of a hand held device such as that described in the applicant's applications/granted patents USSN 09/____ (Docket No. ART80US)6,496,654, USSN 09/693,083____ (Docket No. ART81US) and USSN 25 09/693,134____ (Docket No. ART82US) filed concurrently herewith by the present applicant the content of which is hereby specifically incorporated by reference. These applications/granted patents make reference to the applicant's prior applications/granted patents USSN 09/113,070 (Docket No. ART02US)6,476,863 and USSN 09/112,785 (Docket No. ART29US)6,459,495.

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The aforementioned patent specifications disclose an apparatus including a camera system, hereinafter known as an "Artcam" type camera system, wherein sensed images can be directly printed out by the camera unit using an inkjet pagewidth printhead having at

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least four separate inkjet nozzles for printing a color image and an infra-red image simultaneously on a print media. A pagewidth printhead of this type was described by the applicant in co-pending granted patents applications USSN 09/608,308 (Docket No. CPE01US)6.471.331, USSN 09/608,779 (Docket No. CPE02US)6.676.250, USSN 09/607,987 (Docket No. 5 CPE03US)6.347.864, USSN 09/608,776 (Docket No. CPE04US)6.439.704, USSN 09/ _____ (Docket No. CPE05US)6.425.700, and USSN 09/607,991 (Docket No. CPE06US)6.588.952 and the descriptions thereof are hereby specifically incorporated by reference.

In the above referenced patent specifications, namely USSN 09/ _____ (Docket No. ART80US)6.496.654, USSN 09/693.083 _____ (Docket No. ART81US) and USSN 10 09/693.134 _____ (Docket No. ART82US), data in a fault tolerant encoded form is printed in infra-red ink over a color image. The data which was described in each of these specifications related respectively to storing a fault tolerant encoded digital form of the image itself, a fault tolerant encoded digital form of the image itself along with an image processing program script which enabled the image to be processed to produce a given effect thereon, and a copy of the image itself 15 and of a transformed copy of that image, the transformation being achieved by a program which could be separately loaded into the camera system.

In the present application, the invention resides in recording digital data on an image, the digital data relating to other than the image itself or any manipulation thereof. For example, as described in the applicant's prior art of USSN 09/113,070 (Docket No. ART02)6.476.863 a card 20 may be printed using a fault tolerant digitally encoded form comprising a book on one surface of a print media while on the other face of the print media an image is recorded, for example in this case the dust jacket of the book. The cards that were described were of the size of a credit card of approximately 85mm x 55mm size. The card was printed on both faces. In the present invention the card needs only to be printed on one face with the data being recorded in infra red ink and thus 25 invisible to a human reader. As described in the applicant's co-pending applications/granted patents USSN 09/ _____ (Docket No. ART80US)6.496.654, USSN 09/693.083 _____ (Docket No. ART81US) and USSN 09/693.134 _____ (Docket No. ART82US), a card of 30 approximate size 4" x 6" (102mm x 152mm) can contain approximately 3-4megabytes of data depending on how the data is encoded and distributed across the surface of the card. The data in those applications is distributed in such a way that full recovery of the data there encoded, namely an image, can be recovered even if up to 30% damage has occurred to the surface of the card. To store an average page of text

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requires approximately 2 kbytes of digital data for text only, hence 3 megabytes of data would record approximately 1.5 thousand pages of written text. An average book contains between 250-550 pages and such a book is readily accommodated by the format of the present disclosure. In addition, images may be interspersed with the text as thumbnail (reduced sized) images in a suitable file format for example jpeg, gif, tiff, bmp to name a few.

5 The preferred embodiment provides an adaptation of the particular technology as disclosed in the aforementioned patent specifications USSN 09/_____ (Docket No. ART80US)6,496,654, USSN 09/693,083_____ (Docket No. ART81US) and USSN 09/693,134_____ (Docket No. ART82US). In this adaptation, the camera system and the printing system is dispensed with and 10 replaced with a large screen reader. The cards according to the preferred embodiment are then provided having an indicator of the information which is recorded on the card. The information in a fault tolerant 15 encoded form is printed in infra-red ink over that indicator. For example the card could include a book's content or a newspaper content. An example of such a system is as illustrated in Fig 1 wherein the card 10 includes a book title on the card with data printed thereon in infra-red ink as shown by arrow 11. The card 10 is inserted in the reader 12 which includes a flexible display 13 which allows for the folding up 20 of the card reader 12. The card reader includes display controls 14 which allow for paging forward and back and other controls of the card reader 12.

It can therefore be seen that the arrangement of Fig 1 provides for an efficient distribution of 25 information in the form of books, newspapers, magazines, technical manuals, and so forth.

20 Various inkjet technologies can be used for printing of the card according to the current disclosure, for example an inkjet pagewidth printhead such as disclosed in the applicant's co-pending granted patents/applications USSN 09/608,308 (Docket No. CPE01US)6,471,331, USSN 09/608,779 (Docket No. CPE02US)6,676,250, USSN 09/607,987 (Docket No. CPE03US)6,347,864, USSN 09/608,776 (Docket No. CPE04US)6,439,704, USSN 09/_____ (Docket No. CPE05US)6,425,700, 25 and USSN 09/607,991 (Docket No. CPE06US)6,588,952 may be used. Suitable infra-red ink is disclosed in the applicant's co-pending applications, Australian provisional patent applications PQ9412 (Docket No. INK01) and PQ9376 (Docket No. INK02)-filed on 14 August 2000 and applicant's applications PQ9509 (Docket No. INK03)-filed on 18 August 2000, and PQ9571 (Docket No. INK03A), and PQ9561 (Docket No. INK04)-filed on 21 August 2000.

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Data may be encoded in a manner or using a format as disclosed in applicant's USSN 09/113,070 (Docket No. ART028US)6,476,863 and USSN 09/112,785 (Docket No. ART29US)6,459,495, or USSN 09/_____ (Docket No. ART30US)6,496,654, USSN 09/693,083_____ (Docket No. ART81US) and USSN 09/693,134_____

5 (Docket No. ART82US), for example the Artcard format or the alternative Artcard format. Other formats may be used.

It would be appreciated by a person skilled in the art that numerous variations and/or modifications may be made to the present invention as shown in the specific embodiment without departing from the spirit or scope of the invention as broadly 10 described. The present invention is, therefore, to be considered in all respects to be illustrative and not restrictive.

ABSTRACT OF THE DISCLOSURE

5 An user interface for reading data recorded in infra-red on the face surface of a card upon which may also be recorded a visual representation is disclosed. The reading apparatus
comprises scanning means for scanning in the encoded fault tolerant digital form of the data
on the surface, means for processing the scanned data and for decoding the data into a
secondary digital format and means for outputting the secondary digital format to an output
device with which the secondary digital format is usable. The output device presents the
10 data in a human readable form. The data may include text and/or images equivalent to recording a book, newspaper, manual or a database.

Figure 1

ART84US